

CLAIMS

1. A process for producing high purity 1,1,1,2-tetrafluoroethane and/or pentafluoroethane by a step of purifying a crude product obtained by reacting
5 trichloroethylene and/or tetrachloroethylene with hydrogen fluoride comprised of a main product including 1,1,1,2-tetrafluoroethane and/or pentafluoroethane, hydrogen fluoride as an azeotropic component with the main product, and impurity ingredients including at least
10 an unsaturated compound, wherein said purifying step includes a step of bringing a mixture obtained by newly adding hydrogen fluoride into said crude product into contact with a fluorination catalyst in the vapor phase to reducing the content of the unsaturated compound
15 contained in said crude product and a distillation step.

2. A production process as set forth in claim 1, wherein the content of the hydrogen chloride contained as the impurity in said crude product is 2 mol% or less.

3. A production process as set forth in claim 1 or
20 2, wherein the concentration of the 1,1,1,2-tetrafluoroethane and/or pentafluoroethane contained in said crude product is 70 mol% or more.

4. A production process as set forth in any one of claims 1 to 3, wherein said unsaturated compound is at
25 least one compound selected from a group consisting of 1,1-difluoro-2-chloroethylene, 1,2-difluoro-1-chloroethylene, 1-chloro-2-fluoroethylene, 1,1,2-trifluoroethylene, and 1-chloro-1,2,2-trifluoroethylene.

5. A production process as set forth in any one of
30 claims 1 to 4, wherein said fluorination catalyst includes at least one metal element selected from a group consisting of Cu, Mg, Zn, Pb, V, Bi, Cr, In, Mn, Fe, Co, Ni, and Al.

6. A production process as set forth in any one of
35 claims 1 to 5, wherein a contact temperature between said mixture and said fluorination catalyst is within a range of from 130 to 280°C.

7. A production process as set forth in any one of claims 1 to 6, wherein a mixture obtained by newly adding hydrogen fluoride to a crude product comprised of a main product including 1,1,1,2-tetrafluoroethane, hydrogen fluoride as an azeotropic component with the main product, and impurity ingredients including at least an unsaturated compound is brought into contact with the fluorination catalyst in the vapor phase to reduce the content of the unsaturated compound contained in said crude product.

8. A production process as set forth in claim 7, wherein the contact temperature between said mixture and said fluorination catalyst is within a range of from 130 to 200°C.

9. A production process as set forth in any one of claims 1 to 8, further comprising separating the hydrogen fluoride in said distillation step and recirculating the separated hydrogen fluoride to a step for obtaining said crude product.

10. A 1,1,1,2-tetrafluoroethane obtained by the production process as set forth in any one of claims 1 to 9, wherein a total content of chlorine-containing compounds in said 1,1,1,2-tetrafluoroethane is 2 volppm or less.

11. A process for production of pentafluoroethane and/or hexafluoroethane comprising reacting the 1,1,1,2-tetrafluoroethane as set forth in claim 10 and fluorine gas in the presence of a diluting gas.

12. An etching gas comprising pentafluoroethane and/or hexafluoroethane obtained by the production process as set forth in claim 11.

13. A cleaning gas comprising pentafluoroethane and/or hexafluoroethane obtained by the production process as set forth in claim 11.